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CONFIDENTIAL

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February 20th, 1948

Dear Mr. [REDACTED]:

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In the light of our discussions on the subject of a Silent Engine, we have made a preliminary study of the project and are enclosing herewith a proposal for a steam-driven generator to fill your requirements.

Our investigations have covered the fields of the engine and generator themselves, a boiler suitable for operation upon almost any available fuel, a water conservation system which includes condensing means for recovery of the water from exhaust steam, and auxiliary apparatus.

If the equipment is to be used for only one type of fuel, it will be possible to cut down the size of the boiler to the specific requirements of that fuel, for example: operating on butane gas, the burner requirements are decreased in size quite considerably. Operated on butane, or other petroleum fuel, such as fuel oil, gasoline, etc., the machine will run approximately ten hours on five pounds of fuel.

The design is based upon the availability of water to use as a cooling medium in the condenser. This water need not be flowing, and might be obtained by immersing the condenser in a bath-tub or other similar receptacle. An air cooling system for condensing the steam is entirely feasible, and has been considered; but such a system would require additional space and weight for its proper operation.

In carrying out this preliminary design a very conservative rating has been adopted, so that the space and weight specifications represent an expected maximum. It is entirely possible that some reduction can be effected within these limits and it is also to be expected that a less conservative design of lighter components and greater compactness can be evolved when it is known that the tentative operating requirements are not to be exceeded. In other words, the overload factor may be reduced after field tests with the first equipment.

At the present time it is planned to package the essential elements in the space mentioned in the proposal. The various elements can be readily disassembled for transport in smaller unit packages and can be re-assembled for operation without difficulty.

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Proposal for steam-driven generator~~CONFIDENTIAL~~

Automatic controls for unattended operation of the generator, or for operation by completely unskilled personnel, are contemplated in the design. With the addition of a small amount of auxiliary apparatus, it is expected that the equipment can be arranged to operate with a liquid or gaseous fuel for thirty to sixty days completely unattended, if such operation is required. }

The basic design that we have worked out is suitable for scaling up to other sizes if a change in power requirements is necessary. This is one of the results of the present design, which includes many features which have not been put to practical use in any equipments of this character.

We have been able to secure the services of [] for this project. [] is a Consulting Engineer (mechanical) with twenty-five years experience and a graduate of California Institute of Technology. He has spent ten years on the development of small steam plants and is thoroughly familiar with the design problems peculiar to this type of operation. He is one of the two outstanding authorities in the country on this kind of work.

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If you have any questions regarding this proposal, we will be glad to discuss them with you.

Sincerely yours,

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MDMcF:ams

Encl. - proposal

Airmail

Registered - rrr

Letter and proposal
enclosed - original and
three carbon copies.

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February 20th, 1948

Attention:

Sir:

P R O P O S A L

Pursuant to discussions between your engineers and engineers of this Company, the following proposal is submitted:

Upon execution of a contract (or letter of intent) in a form similar to the contract under which we are now operating, we will undertake on behalf of the United States Government:

One: To conduct research and design engineering ^{leading} relating to the development of a portable steam-driven electric generator unit, including boiler, burner, condenser, etc., to the following specifications:

- (a) Continuous output ~~rating~~ of the generator is to be 100 milliamperes at 400 volts, and 1.5 amperes at 6.3 volts.
- (b) Size of unit is not to exceed 10" x 18" x 26" and weight not to exceed 25 lbs. }
- (c) The apparatus will operate on any liquid, gaseous or solid fuel, of 6,000 BTU or better per pound. }
- (d) The equipment will be silent in operation to a degree conformable with the operating requirements laid down. The actual rotating parts will be enclosed in a soundproof housing having high attenuation in the audible range.

Two: ^{Upon completion of above, develop detailed specs &} To furnish an experimental equipment in accordance with the above specifications.

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PROPOSAL - Steam-driven electric generator unit.

- Three: To furnish necessary test equipment and suitable spares for said equipment.
- Four: To furnish operating and maintenance instructions for said equipment.
- Five: To furnish progress reports on the progress from time to time as directed, and a final report at the conclusion of the project.
- Six: To consult at frequent intervals with your engineers and to modify the program in accordance with their requirements and your instructions.
- Seven: To conduct all work and to keep all records in accordance with applicable security regulations.

For purposes of mechanical fabrication the model shop facilities of the R. A. Hawks Co. are employed on a sub-contract basis at a fixed charge of \$3.50 per hour: this figure being subject to change in accordance with prevailing wage rates.

This proposal is submitted on a basis of cost plus a fixed fee with the fixed fee being 7% of the total cost. An allowance for overhead costs not otherwise chargeable directly to the contract is not to exceed 100% of the total costs of salaries and wages: the actual charge for overhead costs will be substantiated by audited report. Our books will be open to inspection by your representatives at all times.

It is estimated that the program contemplated under this proposal will occupy a time of fifteen months from the start of work and that the cost thereof will not exceed the sum of Ninety-five Thousand Dollars (\$95,000.00).

We are prepared to start work on the program immediately upon authorization from you.

Very truly yours,

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MDMcF:ams

w/ltr of transmittal.

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Registered - rrr

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